From Better to Best:

Comments on Draft Recommendations on a Greenhouse Cap-and-Auction System for California

Written comments on report of the
Market Advisory Committee of the California Environmental Protection Agency entitled
"Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California"

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I. Introduction

These are the comments are focused on new issues raised by the MAC Draft recommendations. It does not reiterate points previously made in our initial testimony, *Just, Effective and Efficient Climate Policy: Making It Happen in California*. However, it is worth observing that important parts of that testimony appear not to have been adequately addressed by the (generally excellent) Draft. See especially section III of that testimony, on consumption-based accounting as a solution to leakage and competitiveness problems; section IV.B on estimating the revenue required to fully offset regressively and consumer burden; section IV.E on the high cost of output-based allocation; section V. on intelligent integration of market-based and regulatory approaches to emissions control; and Appendix D on Commerce Clause and GATT/WTO issues.

II. More comprehensive coverage is needed than is provided by the MAC recommendations, and especially Option A, in order to minimize costs and assure that state targets are met.

A. Comprehensive coverage is necessary to assure that California's emission reduction targets will actually be met.

The non-market policy set under the California Global Solutions Act of 2006 ("the Act") now embodies literally hundreds of individual policies and standards. The chance of all of them working as well as projected in the timeframe proposed is near zero. Moreover, few are structured in such a way as to be able to achieve significantly higher than projected reductions. Moreover, few of these policies can be tightened in a quick and relatively painless way. Thus if California is to achieve the reductions mandated by law in 2020, the market mechanism will have to address the shortfall.

This is a very important point, which should shape the entire discussion about the implementation of market mechanisms. Although the language about adoption of a system of allowances is permissive rather than mandatory, it may not be possible to meet other mandates under the act without such a system. For example, the Act requires that the scoping plan and its regulations achieve emission reductions to the lesser of 1990 level or the feasible and cost-effective level by 2020 at the latest, and that this limit be *enforceable*. Section 38562(d)(1). This suggests that the CARB really must adopt a cap and allowance system in order to achieve a scoping report that assures that the targets are hit. The only alternative (besides denial) is to mandate by regulation reductions in emissions well in excess of the statutory target, in order to provide room for some regulations to fail. But this fails another requirement of the statute, that it "minimize costs and maximize the total benefits to California." Section 38562(b)(1).

Although many regulations may be achievable at a net savings, the cost minimization requirement mandates adoption of a market-based allowance system if any of the regulatory provisions impose positive net costs overall. This is because an allowance system with a specified price of allowances will find only reduction opportunities below that price. As a result, if some of the regulations impose net costs, there will be some price of allowances such that the allowance system finds emissions that are of lower cost than the most expensive regulation. As discussed in the next section, this same standard requires that coverage of any allowance system be as comprehensive as feasible.

B. Comprehensive coverage is vital for least-cost emission reductions.

Let us suppose that the cap is binding and some portion of the emission reductions required to hit the state target, say, e.g., ten percent, comes from the allowance system. Because in each covered sector, people will pursue the least expensive

options first, the broader the coverage the more low-cost options are available and the lower the total social cost of the reduction is. Also, the more responsive emissions from a sector are to price, the higher the cost from excluding a sector.

Although there has been a great deal of research done on the demand for fuels by sector, in California the allowance system will be implemented on top of an extensive new system of regulations. The price response by sector of the remaining emissions after regulation is not known and can not be reasonably estimated with the data available at this time. The best we can do now is to get a first-order approximation of the cost of exclusion by assuming the price response is the same across sectors. The table below estimates the percentage increase in the total social cost of emission reductions caused by excluding some sectors, sectors relative to the coverage of Program 3 or 4 plus jet fuel plus N_2O from vehicles. This combination would cover 83% (program 3 or 4) + 4.5% (jet fuel) plus 2.5% (mobile sources) = 90% of all emissions. The only assumption required for these estimates is that the elasticity (i.e. price responsiveness) of emission reductions for all sectors.

Col #	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Policy Set	Program 1	Program 2	Program 3 & 4	(3) plus mobile N_2O	(3) plus jet fuel	(3) plus both
% Coverage	39.0	72.0	83.0	85.5	87.5	90.0
% cost increase	130.8	25.0	8.4	5.3	2.9	0.0

The table shows that the increase in the total cost from failing to cover some sectors can be substantial. Particularly noteworthy is that achieving a specified reduction under program 1 is more than double the cost of achieving the same reductions under the comprehensive program. The rationales for including jet fuel and N_2O from vehicles is below further discussed below, as is a second reason to believe that these cost estimates understate the cost of partial coverage.

Given that the phase-in of Option A more than doubles the early cost of the program, it is worth examining the arguments against immediately adopting an upstream approach as suggested in option B. I will also briefly discuss a third alternative, sometimes called a “midstream’ approach.

C. Comprehensive coverage reduces economically and environmentally costly distortion.

Finally, please observe that the costs of various levels of partial coverage given in the earlier table do not include the costs of distortion that come from the potential for emission-reducing energy flows across the boundary between a covered and an

uncovered sector. Most of these involve an emissions reduction in the uncovered sector that is partially offset by a smaller emission increase in the covered sector. This results in the allowance system discouraging innovations that reduce net emissions, as the increase in cost of emissions in the covered sector from the allowances is not offset by any decrease in costs in the uncovered sector. Examples of this abound, and I will provide only a few here:

- If the transportation sector is not included, plug-in hybrids are discouraged because increase in covered electrical emissions is not offset by the uncovered reduction in motor vehicle emissions.
- If electric but not gas utilities are covered in the residential sector, then the use o ground-source heat pumps to replace gas-fired systems is discouraged.
- If the manufacture of biomass fuel involves positive emissions (e.g. from distilling) that are less than those from the conventional fuels they displace, and jet fuel is uncovered then the use of renewable content in jet fuel is discouraged.

The exact cost of such distortion is unknown, but the plug-in hybrid example suggests that it cold in principle be quite large.

D. Jet fuel and N_2O from motor vehicles can easily be accurately measured and should therefore be under the cap.

We assume that the reason jet fuel was excluded was because of the possibility of evading the cost of allowances by choosing to purchase fuels out of the state. It is easy to prevent this sort of evasion by using the method of calculating fuel use that the International Fuel Tax Agreement (IFTA) uses to allocate motor fuel consumption by heavy trucks to states for tax purposes. Total fuel consumption is allocated to the states proportionally to the number of miles traveled in each state for tax purposes, regardless of where the fuel is purchased. Carbon dioxide emissions from burning jet fuel can be allocated the states in exactly the same way. See Appendix B. of my Testimony for additional discussion of this issue.

N_2O from motor vehicles can also be covered, albeit with somewhat more difficult politics. Obviously, this can not be done perfectly, but it can be well-approximated in by a weighted combination of allowance requirements based on motor fuels consumed (administered as an adder to the emissions content of motor fuels) and a one-time requirement that the first seller or importer buy allowances based on the average emissions for the make and model year. It has been shown that this combination provides a good approximation of true emissions. Ooops! I omitted the citation for the claim that you can get a good approximation of a tailpipe emissions charge on N2O with a two-part instrument. There are actually two slightly different approaches, the first of which is slightly more efficient than the second (because of their respective incentives for car ownership). On the possibility of approximating a motor vehicle emissions charge with a motor fuel

surcharge and a per vehicle charge on high-emission vehicles based on average emissions from vehicles of that class, see: G.S. Eskeland, "A Presumptive Pigouvian Tax: Complementing Regulation to Mimic an Emissions Fee," *World Bank Economic Review* (1994), 373-394. On the possibility of approximating it with a gasoline surcharge and a subsidy for cleaner vehicles, see: Don Fullerton & Ann Wolverton. "The Case for a Two-Part Instrument: Presumptive Tax and Environmental Subsidy" NBER Working Paper No. 5993 (April 1997); published in: *Environmental and Public Economics: Essays in Honor of Wallace E. Oates*, Panagaria, A., P. Portney and R. Schwab, eds., Cheltenham, UK: Edward Elgar, 1999, pp. 32-57.

E. The Midstream approach

The midstream approach recognizes that it does not matter where in the chain from mine mouth or wellhead to ultimate combustion the allowance requirement is placed, so long as it is placed somewhere. It therefore looks for "narrow points" in the distribution cycle or points where monitoring already takes place, to minimize administrative burden and costs. One drawback of the midstream approach is that it often requires additional rules for some class of emissions that is not picked up at the enforcement point. But this may be a good trade for the overall saving in cost.

An example of the midstream approach would be to place an allowance requirement for petroleum products at the terminal rack, where tanker trucks that take fuels to gas stations are filled, and where the flows are already carefully monitored for federal tax purposes. On could include in the carbon content of these fuels the average emissions associated with refining. This would avoid the necessity of monitoring the flow of refined or crude oil through ports or interstate trucking. California refiners with emissions per gallon above the average would be required to purchase allowances for the surplus of emissions over the average emissions times the number of gallons they produce. If less, they would get an allowance rebate in a comparable amount.

Sourcing electric generation and natural gas emissions at utilities can also be considered a midstream approach. Such an approach might need special rules for some non-utility generators not otherwise covered.

We believe that the midstream approach is a viable alternative to the upstream approach that deserves consideration. Most of the arguments in favor of an upstream approach made above also apply to a midstream approach.

III. The upstream approach is superior to the downstream approach by virtually every measure.

The Draft report provides six reasons in support of the passed approach. Claims 1,2,3, and 6 are false. Claims 4 and 5 are true, but irrelevant, as they establish no public or private benefit. Let us take them in turn.

1. The ability to begin the program in the very near future with implementation of the first step (Program 1)

This would indeed be a significant advantage if CARB were contemplating initiating the market mechanism, say, next year. But as best as I can tell, no one is contemplating implementing the market mechanism any sooner than 2011 or 2012. This is plenty
of time to craft regulations for a more comprehensive system, especially given the much smaller number of entities to be regulated.

2. The flexibility associated with a more gradual expansion of the cap-and-trade program's scope

Flexibility to institute a program with higher costs that provides less certainty of emission reductions is a disadvantage, not an advantage.

3. Greater prior experience with the downstream regulatory approach—experience that reduces risk and can help lower administrative costs

Any benefit from greater experience to either risk reduction or administrative cost reduction is surely far more than offset by the fact that under a downstream system one is regulating thousands of highly diverse entities, while under the upstream system one is regulating a few dozen entities, all of which fall into a handful of enterprise types.

4. The fact that downstream entities—the entities that may have the most options for reducing emissions—are the ones required to submit allowances for compliance

It is a truism, one of the first things that one learns in a graduate public finance course, that it makes no economic difference where in a supply chain a tax is levied. However, we agree that markets are not perfect, and that there may be some psychological or informational benefit of measuring emissions downstream, based on the management truism the "people manage what they measure. However, in this case there is already a mandatory measurement system, the registry, being put in place. Thus there is no basis for assuming that placing the requirement for allowance remission on these entities wil provide any additional incentive beyond the price and awareness effects under an upstream system.

In a footnote to the point, the Draft Recommendations state:

> "Many Committee members are convinced that incentives for reducing emissions are strongest when downstream entities must submit allowances. Under Program 4, these entities are not the points of regulation and thus do not submit allowances. Their incentive to reduce emissions stems from the higher fuel prices that result as upstream entities limit fuel supplies subject to the emission constraints established by the cap."

We note that the increase in the fuel cost to a downstream entity from an upstream allowance system is exactly equal to the cost of purchasing allowances by the downstream entity in a downstream system. The economic incentive is precisely equal either way.

5. larger number of regulated entities, which may promote greater liquidity in the allowance market

When allowances are grandfathered, large mismatches between an entity's needed and allocated allowances, increasing with time, are inevitable. Under auction, entities buy only and exactly the allowances they expect to need. Mismatches can easily be met through a combination of banked credits and by allowing shortfalls to be "trued up" by purchase of the shortfall amount in the next auction period. Thus though the larger number f entities may indeed enhance liquidity of the market, this provides no significant public or private benefit.

6. no need for special provisions to reward facilities that engage in carbon capture and sequestration.

The administrative, compliance and enforcement burden required to allow facilities to do capture and sequestration under an upstream approach are exactly identical to the procedures required under a downstream approach. In both cases the capturing entity must separately measure and report the amount of emissions captured and sequestered. The only difference is that in one case the sequestered emissions are subtracted from the allowance purchase requirements, and in the other they result in an allowance rebate.

Now let us turn to the reasons for adopting an upstream system. The report sites three. The first two of these reasons are severely understated. The third, though true, is weak. However, there are also at least six other important reasons for upstream administration. These are listed below as reasons four through nine.

1. The assurance of effective and comprehensive coverage afforded by controlling carbon as it first enters the economy.

As discussed above, such comprehensive coverage is in fact the only way to guarantee that the mandatory targets set by the act are actually reached.

2. The possibility of lower administrative costs because (a) a smaller number of sources are regulated and (b) carbon-based fuels, rather than CO2 emissions from combustion, must be monitored.

This is a huge benefit. We strongly urge that the MAC make some rough-justice estimate of the administrative (i.e. governmental), compliance (i.e. private),and enforcement costs from the

3. The ability to achieve comprehensiveness in one step, which can reduce haggling by regulated entities to obtain special exclusions from participation.

It is certainly true that the additional time till coverage under phase 2 and 3 provides more time for mischief. However, if the system is not going to be put in place for at three to five years, the additional opportunity provided by another year or two of delay does not on its face seem to provide that much additional opportunity.

4. Greater economic efficiency and lower economic cost during the phase-in.

Because it results in the broadest possible coverage immediately, upstream systems substantially reduce the total economic cost of achieving reductions in the early years. See discussion under "Comprehensive coverage is vital for least-cost emission reductions" above.

5. Upstream measurement under the alliance program and downstream measurement under the registry allow cross-checks that can aide enforcement and fraud prevention.

Allowance systems are administratively similar to excise taxes. One of these similarities is that under both, one can make a great deal of money by evasion. If the manufacturer of a product that uses fossil fuels in its production is able to evade the allowance requirement, they can sell that product into markets where the price is set by honest competitors who have bought allowances, and pocket the difference. For some products this could amount to hundreds of millions of dollars.

Experience with such instruments has taught that a system of cross-checks is essential in order to identify evaders. Under an upstream system, downstream registry requirements provide one such check.

6. No incentive for fraud in downstream inventories.

Unlike the downstream system, which provides a strong monetary incentive to under-report, an upstream system provides no such incentive. As a result the inventory will be more reliable.

7. No incentive for litigation over inventory rules and regulations by downstream entities.

Unlike the downstream system, which provides a strong monetary incentive to litigate and dispute inventory rules, an upstream system provides no such incentive. This not only will reduce costly litigation and the associated delay, but will promote a more collegial relationship between the regulatory community and downstream entities, as most interactions with regulators will involve opportunities to achieve profitable energy cost reductions.

8. Less amenable to special interest pleading that increase system costs and weaken the environmental protection.

Under downstream systems, exemptions and other special rules for particular industries, firms, or regions, for specific fuels or in general, are very easy to legislate, design and administer. Under an upstream system, such provisions are difficult to design and administer, requiring special allowance rebate systems that are costly and obvious. The additional costs and public relations risk from such programs reduces a business's incentive to ask for them and legislative and regulatory willingness to grant them.
s and presumably harder to legislate as well.

9. More reliable enforcement.

As discussed above, the monetary benefit from evasion of the allowance requirement can be substantial. It appears doubtful that the additional budget for auditors, investigators, and prosecutors will account to much. If there are only a few dozen regulated entities, and reasonable cross-checks, we may be able to make fraud difficult and costly and apprehension for such fraud likely, deterring it before it occurs.

IV. Offsets are hard to measure and when measured correctly should be discounted by a factor of five.

A. Offsets should be discounted by a factor of five.

How should we set the allowable level of offsets? Is there a ***principled basis*** for the level of offsets that we should allow? In this section we show that, for offsets that do not push the envelop of technology, in addition to the usual requirement that the offset be real, verifiable, additional, permanent, etc., they should also be discounted by a factor of five, i.e. it should take five tons of offsets to balance an avoided ton of domestic emissions.

One argument that has often been made is that in principle there should be no limit on offsets, provided one can assure that offsets are real, additional, verifiable, permanent, etc. This is the position taken in the draft MAC report. The arguments for this position are clear and compelling: that one should cut the total cost of achieving emission reductions by seeking least-cost reductions wherever they are found. We understand the appeal of this argument. However, we believe it to be fallacious, because it does not recognize the fundamentally different natures of emission reductions achieved through technological improvement and emission reductions achieved through low-cost offsets, primarily biological sinks and bringing inefficient facilities up to developed-world standards.

Technology is not rival, i.e. improvement in technology by one nation not only does not deplete the stock of technology for other nations, but actually increases the generally available supply of technical knowledge. Most offsets, on the other hand, are part of an exhaustible stock of low-cost emission reduction alternatives. When a nation purchases an offset, it increases the cost of offsets to all other nations by depleting the stock.

Thus it is reasonable to adopt a "Golden Rule" assumption for technology improvements: that the developed nations will achieve percentage emission reductions comparable to those that we achieve. This is reasonable both under an "equality of effort" standard and because the developed nations largely share a common technology.

With respect to the developing nations, the situation for technology is less clear. Developing nations have emissions per dollar of gross national income (GNI) that are about 3.7 times those of the developed nations. See table below. This is due to a mix of technological lag and the compositional effect, in which developing nations first strive to increase their production of food, housing, and export goods, all relatively high-energy, and then beginning at about $10,000/capita transition toward the developed-nation GDI composition that consists primarily (in value terms) of low-energy services. As the table below shows, the World Bank's "middle-income" category, though it has nearly three times the income per capita (measured in purchasing power parity (PPP)) of the low-income nations, has nearly the same emissions per dollar of income.

	Population	GNI	GNI	GDI	CO2	CO2	CO2
	mill.	($ Bill. PPP)	($PPP/ capita)	Growth rate	Tonnes/ capita	Tonnes (Mill)	Tonnes/$1000 GNI
Low income	2,343	5,291	2,258	6.5	0.8	1874.4	1.58
Middle income	3,018	20,051	6,644	7.2	3.3	9959.4	1.45
High income	1,004	31,138	31,009	3.4	12.8	12851.2	0.40

Source: Calculated from World Bank, *World Development Indicators 2006*, http://devdata.worldbank.org/wdi2006/contents/Section1.htm

Anticipated growth over the next 43 years will leave much of the develop world still in the income range where the composition of GDI will remain relatively energy-intensive. However, it is worth noting that the ratio between the developed-world's emissions per dollar of income and the developing world's has remained nearly constant since at least the 70s, while both ratios have imprioved significantly. Thus is appears that, though the developing world has a generally low er level of technical efficiency, that their growt I technology moves roughly evenly with the developed world. This makes sense in a model in which most technologies start on the developed world and diffuse to the developing world. Thus we can reasonably assume that technological progress alone will not cause a convergence of developed-world and developing world emissions per dollar, but that improvements will be reflect as comparable improvements in the emissions per dollar ratio.

Currently the developing world has about twice the growth rate in income of the developed world, about a 35% higher population growth rate (the latter based on a World Bank 20 year projection). If this difference continues, by 2050 the aggregate GDI of the developing world will move from its current level of about 80 percent of ours to being 3.7 times ours. If emissions were also to continue at their current level of 3.7 times ours, developing world emissions will be almost 14 times ours. The IPCC business as usual scenarios show a lower ratio, roughly four to one, because they assume that the poorest part of the developing nations will grow at a much lower rate, and the richer part will grow at a sufficiently high rate that they will get into the region where the compositional effect will slow their emissions growth significantly.

Taking the IPCC's conclusions as correct, combined with our previous conclusions about technology, we find that a percentage of emission reductions achieved by developed nations through technological improvements will then result in roughly four times the emission reductions by developing nations. Thus each ton of emissions reduced in this way will result in five tons of emission reductions world wide.

Although we may reasonably assume that the share of our emission reductions that we achieve through low-cost offsets will b comparable to that of other developed nations, developing nations will presumably sell their low-cost emission reductions to developed nations. Thus there is no developing-world multiplier effect for emission reductions through offsets.

We concluded that; viewed through the lens of our long-term emission reduction goals, reductions achieved through domestic technological improvements in developed nations result in five times the global emission reductions as reductions achieved through offsets. Thus California should adopt a standard that, in addition to assuring that such reductions are real, additional, verifiable, permanent, etc., five tons of offsets (of the sort that do not push the edge of new technologies) soul be required to offset a ton of direct emission reductions. This standard should apply whether the offsets are foreign or domestic.

So far this argument has been framed primarily in terms of the efficiency conditions for a sound climate policy. Offsets do not enjoy the large positive technological externalities that efficiency improvements and renewable technology improvements do. But it can also be framed in terms of a feasibility constraint. Investing in reduction opportunities with large technological spillovers is necessary to achieving a sustainable global emissions level. This is true because, I the absence of technological improvement *and spillovers*, in 2050 emissions from the developing world alone will be *three to five times the sustainable level*. No plausible offset program will be adequate to cope with emission overages of this magnitude.

B. Many apparently valid offsets actually result in no emission reductions.

In this section we show that the requirement that offsets be real, verifiable and permanent is often quite difficult to assure, giving several examples of apparently real but actually fictitious offsets.

Many commonly proposed offset types have little or no effect on global emissions, or can not be verified in any determinate manner. Foe example:

Emissions from the permanent preservation of logged forests results in no emission reductions unless parallel steps are taken to reduce the global demand for wood by and amount equal to the foregone cutting. This is because the same trees will simply be cut down elsewhere. It is less obvious but also true that tree planting in reserved land has no effect if the land so reserved would otherwise have been used for some non-forest activity. This is because the activity that did not take place on the planted land is likely to take place elsewhere, resulting in deforestation that may offset, or in some cases exceed, the emissions sequestered by planting.

Emission reductions from re-powering of existing facilities, or the replacement of existing equipment with more efficient equipment, on a project basis, is inherently

unverifiable. There are two reasons for this. First, it is never clear that the equipment in question would not have otherwise been junked. Facilities that are good candidates for replacement are nearly always also among the facilities most likely to be shut down as uneconomical. Second, it is never demonstrable to what extent the achieved improvement would not have been achieved in any event through domestic action. The only case where such domestic action can be clearly shown to be unlikely is when the improvement itself is uneconomical, as when sequestration capacity is added to an existing facility. But these uneconomical additions are rarely low-cost relative to emission reduction opportunities available domestically.

Emission reductions from replacing new facilities with higher-quality facilities than would otherwise be built are likewise unverifiable because there is rarely any assurance that the new facility would have been built at all in the absence of foreign financing.

These examples could be multiplied, but they suggest at a minimum that offsets should be allowed only from sectors that either do not produce traded goods, or produce such goods under comprehensive national caps with emissions embodied in imports and exports being covered under the cap.

V. Recommendations on the overall form and content of the report.

A. Avoid premature political compromise.

We understand that some MAC members are not making the strongest case for certain recommendations that they know to be superior from a public policy point of view because they believe them to be politically unrealistic, or were convinced that they would be outvoted. While political considerations will ultimately play a part in the design of a market mechanism as finally implemented, it is vital to realize that no one is going to compromise the system cleaner, or more efficient. No special interest provisions are going to require the auction of a higher share of allowances. No back-room deal will make the extent of coverage higher, or more uniform. The MAC report is likely to be the high-water mark of the entire regulatory process.

This tells us something important about what the people of California need from this report. We need a plan is clean, simple, and comprehensive; a plan that reflects the best economic thinking. We need you to recommend design decisions that make it harder to implement special exceptions, not easier. We need a clear statement of what should be common knowledge: that the plan that serves the public best is one that is comprehensive form the beginning, implemented upstream to make it harder to muck up (with downstream reporting through the registry to promote widespread managerial attention to emissions), and auctioned 100

percent, so that the money that is collected from California consumers, business and family alike, can be returned to them.

The compromising that the MAC is doing on the scope of coverage and point of implementation is *premature*. This is true, first, because preemptive capitulation is never a sound bargaining strategy. We need a plan good enough that people can compromise from it and still have something good. And second, because *every specific deviation from the public-interest ideal has powerful natural enemies*. It is the job of the advocacy community to mobilize those enemies in support of good policy; and this is proceeding apace if not always in the public view. But we need your help. We need an uncompromised proposal to fight for. And we need clear statements of the costs that accompany each kind of compromise, that we can wield as weapons for the truth.

In 1984, President Ronald Reagan charged a small group of senior economists and lawyers at the Department of the Treasury to produce an overall simplification and improvement of the tax code, without substantially changing the revenue raised or the progressivity of the distribution of burden. After ten months of study, this group produced the document now known as Treasury I.

Treasury I was devised with no attention to politics, but only to policy. No reasonable person should have expected that it could be adopted unaltered, and it wasn't. But it did a miraculous thing. First, it was endorsed by both Citizens for Tax Justice and The Tax Foundation, at opposite ends of the political spectrum. Next, it led to the most engaged discussions between Democrats and Republicans on tax policy to occur in our lifetimes. And third, it was the basis for the Tax Reform Act of 1986, the most important and fundamental reform of our nation's tax policy ever to occur in peacetime.

It is universally acknowledged that this reform would never have happened if it were not for Treasury I. And people laboring in the bowels of the Treasury bureaucracy like Gene Steuerle and Charlie McLure have earned a permanent place in the history of American tax policy because they *thought clearly* and *spoke the truth*. If they had tried to craft a politically acceptable proposal, they would already have been forgotten.

This is California's hour. California can be a shining example, setting the mold for national, and ultimately global policy. We can choose that, when the history books are written, they will say the pivotal event in moving from worsening the climate problem to solving it was accomplished here and by us. Recognizing that this work is likely to be the most momentous thing that most of us, it is time to put aside compromise and set the bar as high as we can manage, aiming California climate policy for the treetops by aiming the MAC report for the stars.

Let us translate this into a few concrete suggestions:

B. Emphasize the optimal policy.

By now there should be little disagreement about what the best climate policy looks like. It is as comprehensive as can be managed with accurate measurement and reasonable compliance, administration, and enforcement costs. It is administered upstream, to assure that it can be enforced and make it harder to carve out special exemptions and exceptions; but with downstream reporting requirements to focus management attention on emission reduction opportunities. It addresses both leakage and competitiveness concerns with load-based emission accounting (or a close analog) for electricity, and analogous policies for other emission-intensive manufactured goods such as refined petroleum products and cement that focus on emissions associated with California consumption rather than Califo0rnia production. It integrates market and non-market policies in a wise and careful way.

The current report goes far in this direction. When compared to RGGI or the European Trading System, it shines. But it still falls short in several important ways: recommending Option A over the clearly superior Option B, suggesting a mix of free allocation and auction rather than 100 percent auction; and containing an inadequate discussion of competitiveness/leakage problems outside of the electric sector. In the last category, the MAC report keeps open alternatives that it should clearly and firmly close, such as output-based allocation. Output-based allocation, like free allocation to regulated sectors with average-cost pricing such as utilities, roughly doubles the total social cost of achieving emission reductions by eliminating the incentive to reduce consumption of the most pollution-intensive products; and then doubles it again by forgoing the benefits of revenue recycling. If you think these are exaggerations, speak to the economists among you. It would be more accurate to say that the quadrupling of social costs is a lower-bound estimate for the losses from output-based allocation relative to auction..

C. Describe alternatives as deviations from the optimum.

Wherever possible, deviations from the optimum, such as partial free allocation or partial coverage of emissions, should be described as such. Make sure that there are clear, forceful, quotable statements of the cost of each deviation from the optimum, such as the cost of full or partial free allocation or of coverage limitations under the Option A phase-in approach. ***It is vital that the report include some rough statement of the magnitude of these costs. This is our strongest single recommendation.*** Without a sense whether you are talking about increases in public costs by ten percent, 100 percent, or 1000 percent, these costs can not effectively be balanced against the political support that the beneficiaries of certain bad policies will surely offer, and all of the careful economic analysis will be vitiated in the public debate. Silence on these questions is effectively a zero estimate, and as such often far worse than even the crudest approximation.

This is not to say that such deviations may not have compelling arguments in their support, nor to urge you to stint on such arguments. Some deviations from optimal policy will surely be required by real-world issues such as administrability and political feasibility. But policy makers and the public need to know what they are paying for such compromises so that they can intelligently ask if they are worth the price.

We understand that there is not the time and resources to do careful and comprehensive literature review, much less new research; but surely order of magnitude estimates such as we suggest can be accomplished based on the common wisdom and long experience of those on the MAC who have studied such matters.

D. Recommend expenditure of allowance revenues on energy-efficiency and to offset burdens on low- and moderate-income households.

Lower bounds on such expenditures are essential in maintaining the progressivity and positive economic benefits of thee integrated climate plan, and as such required by the Global Warming Solutions Act. We discuss the magnitude of such lower bounds in our original MAC testimony. See especially section IV.B.1 & 2 of that testimony.

We would also suggest that the MAC recommend the creation of a few key administrative instruments, such as a carbon fund to contain the revenue from allowance auctions, and perhaps a revolving loan fund to assist utilities and others businesses to make the transition to new cleaner technologies.

E. Acknowledge the vital role of democratic process.

A number of the recommendations of the MAC risk falling on deaf ears because they are outside of the core competency of the Air Resources Board.

This is especially true of auction and of any recommendations on how auction revenues be spent. Full auction could raise upwards of two billion dollars per year, and sum of the most promising possible approaches to returning the revenue to the economy or to consumers, such as offsetting regressivity through the earned income tax credit, or returning the revenue to business by a cut in the sales tax on manufacturing equipment, involve decisions that one would not ordinarily pick CARB to make. Further, there is a risk that in recognition of this problem, CARB will either decide not to auction to avoid the embarrassment of having to assign the revenue, or allocate it all to pollution-control-equipment-like expenditures, whether or not this is really the best use of the revenue.

The MAC report should include a recommendation that CARB convene an advisory group chaired by a person with budgetary experience and wide knowledge of energy, environmental, tax and budgetary policy such as Tom Campbell or Leon Panetta, and including representatives of both the Department of Finance and the Legislature, to prepare a study outlining several sensible options for revenue recycling. The report should also explicitly acknowledge that revenues collected by allowance sales, as opposed to carbon fee revenues under CGWSA Section 38597.